UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,010	08/28/2003	Lawrence E. Pado	BO1 - 0269US	2102

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EXAMINER
HIRL, JOSEPH P

ART UNIT	PAPER NUMBER
2129	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/653,010	PADO, LAWRENCE E.
Office Action Summary	Examiner	Art Unit	
	Joseph P. Hirl	2129	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>02 August 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-72</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-72</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>28 August 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This Office Action is in response to an AMENDMENT entered July 30, 2007

for the patent application 10653010 filed on August 28, 2003.

2.   The First Office Action of April 30, 2007 is fully incorporated into this Final Office

Action by reference.

Status of Claims

3.   Claims 1-72 are pending.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 1-72 are rejected under 35 U.S.C. 102(b) as being anticipated by Pado

et al (USPN 6,185,470, referred to as **Pado**).

Claims 1, 23, 24, 25, 47, 48, 49, 71, 72

Pado anticipates selecting parameters used in a cost function (**Pado**, c5:39-41;

Examiner's Note: (EN): ¶ 11. applies); selecting an input weight to be applied to a

control output by the cost function (**Pado**, c5:50-51); selectively incorporating predicted

future states generated by a neural network model (**Pado**, Fig. 1); iteratively applying a

control input signal from a range of known signals, wherein the control signal is

generated using a signal generator (**Pado**, c4:36-57; EN: signal generator is block 24);

calculating a control output in response to the control input (**Pado**, Fig. 1; c4:52-67;

c5:1-15); determining a control system phase and a control system amplitude of the

control output in response to the control input (**Pado**, abstract; EN: ¶ 11. applies; phase

is interpreted to be represented by a state; it is axiomatic that all electronic signals have

amplitude); and combining a known plant phase with regards to a known signal

equivalent to the control input and the control system phase such that effectiveness of

the cost function parameters, the input weight, and the selectively incorporated

predicted future states is determinable (**Pado**, abstract; EN: ¶ 11. applies; Pado's

Performance Index Optimization is equivalent to a cost function).

Claims 2, 26, 50

Pado anticipates wherein the input weight to be applied by the cost function is

iteratively selected from among a range of input weights (**Pado**, Fig. 1; c4:52-67; c5:1-

15).

Claims 3, 27, 51

Pado anticipates the control input signal comprises a sinusoidal wave which

linearly increases in frequency over time (**Pado**, Fig. 3; EN: such is NN Learning).

Claims 4, 28, 52

Pado anticipates selectively incorporating the predicted future states includes selecting a subset of the predicted future states generated by the neural network model (**Pado**, Fig. 1; c4:52-67; c5:1-15).

Claims 5, 29, 53

Pado anticipates selectively incorporating the predicted future states includes incorporating two of the predicted future states generated by the neural network model (**Pado**, Fig. 1; c4:52-67; c5:1-15).

Claims 6, 30, 54

Pado anticipates selectively incorporating the predicted future states includes incorporating all of the predicted future states and combining each of the predicted future states with a forget factor such that a proportional weight is accorded each of the predicted future states (**Pado**, Fig. 1; c4:52-67; c5:1-15; EN: the forget factor is defined by weight, specification at page 3, line 9).

Claims 7, 31, 55

Pado anticipates the forget factor comprises a base number in the range from .1 to 5.0 (**Pado**, c4:10-24; EN: the forget factor is defined by weights that have values of .1 to 5.0; the weights have values and can be adjusted to the limiting range).

Claims 8, 32, 56

Pado anticipates wherein the forget factor is raised to a positive integer exponent which begins with 1 and is incremented by 1 for each of the predicted states (**Pado**, c5:50-51; EN: W^i where i takes on values 1, 2, 3 ... integers).

Claims 9, 33, 57

Pado anticipates sequencing the combining of the forget factors with the

predicted future states such that each of the forget factors is applied to each of the

predicted future states (**Pado,** Fig. 1; c4:52-67; c5:1-50).

Claims 10, 34, 58

Pado anticipates the range of known signals applied as the control input signal

includes a chirp signal (**Pado**, c2:26-29).

Claims 11, 35, 59

Pado anticipates the cost function includes an expression defined on page 12,

claim 11 of the specification (**Pado**, c5:44).

Claims 12, 15, 36, 39, 60, 63

Pado anticipates the cost function parameters selected is the position gain and

the velocity gain (**Pado,** c5:48-51).

Claims 13, 16, 37, 40, 61, 64

Pado anticipates the position gain selected includes one of 0 and 1 and the

velocity gain selected includes one of 0 and 1 (**Pado,** c5:54-55).

Claims 14, 38, 62

Pado anticipates includes an expression defined on page 12, claim 14 of the

specification (**Pado,** c5:44).

Claims 17, 41, 65

Pado anticipates a combination of parameters and input weight resulting in three

consecutive maximum control output values is dismissed as unstable, wherein the

maximum control output value is the highest output of which the controller is capable in attempting to apply a corrective signal to the operating plant (**Pado**, Fig. 3; such would be wing acceleration during learning).

Claims 18, 42, 66

Pado anticipates iteratively applying the control input from the range of known signals ceases for the combination of parameters and input weight resulting in three consecutive maximum control values dismissed as unstable, wherein the maximum control value is the highest output of which the controller is capable in attempting to apply a corrective signal to the operational plant (**Pado**, Fig. 3; such would be wing acceleration during learning).

Claims 19, 43, 67

Pado anticipates the control system phase is determined by performing a fast Fourier transform of the control output and wherein the control is the response to the control input signal (**Pado**, Figs. 1 and 3; EN: requirements do not provide limitations since control will always be related to the control input signal ... they are the same; and a fast Fourier transform just does a fast Fourier transform without any functional event).

Claims 20, 44, 68

Pado anticipates combinations of the cost function parameters, the input weight, and the predicted future states are considered stable if the sum of the control system phase differential and operational plant phase differential is either between +150 and +180 degrees or between −150 and −180 degrees, wherein the control system phase differential is the phase difference between a control input and a control output, and

wherein the operational plant phase differential is the phase difference between the

plant input and the plant putput (**Pado**, Figs. 4A (424) and 5 (524) cite conditions for

stability different from that of the instant claim (180 degrees +/- 30) and with such

inconsistency, the quantitatively considerations of this claim are ignored; Abstract

anticipates cost, weight and future values).

Claims 21, 45, 69

Pado anticipates more stable combinations of the cost function parameters, the

input weight, and the predicted future states are those for which the sum of the control

system phase and the known plant phase is closest to 180 degrees or negative 180

degrees and less stable combinations of the cost function parameters, the input weight,

and the predicted future states are those for which the sum of the control system phase

and the plant phase is closest to 0 degrees (**Pado**, Figs. 4A (424) and 5 (524) cite

conditions for stability different from that of the instant claim (180 degrees +/- 30) and

with such inconsistency, the quantitatively considerations of this claim are ignored;

Abstract anticipates cost, weight and future values).

Claims 22, 46, 70

Pado anticipates the parameters used in the cost function, the input weights to

be applied to the control output, and the predicted future states are selected based on

stable combinations of the cost function parameters, the input weight, and the predicted

future states (**Pado**, Abstract anticipates cost, weight and future values; EN: stable

combinations are the result of a trained neural network).

Response to Arguments

6.   The rejections of claims 3, 7, 8, 17- 22, 27, 31, 32, 41- 46, 51, 55, 56 and 65-70

under 35 USC 112, second paragraph, are withdrawn.

7.   Applicant's arguments filed on July 30, 2007 related to Claims 1-72 have been

fully considered but are not persuasive.

In reference to Applicant's argument:

Claims 1, 23-25, 47-49, 71, and 72 recite in part:

> "tuning a cost function ... comprising ... iteratively applying a control input signal from a range of
> known signals, wherein the control input signal is generated using a signal generator . . ."

Pado (U.S. 6,185,470):
As noted by the examiner, Pado at column 4, beginning at line 54 discloses a method in which a "system
10 receives sensor feedback y(n) from plant 12; digitizes it and then feeds it via line 32 into the inputs of
neural network 18." However, Pado fails to teach or fairly suggest a method in which the system input
comprises an input signal which "is generated using a signal generator" as recited in claims 1, 23-25, 47-
49, and 72. The use of a signal generator to generate inputs for a neural network avoids the risk of
damage to the plant that may occur mad reduces the time that may be required when using the sensor
feedback from the plant. See Specification, page 2, lines 16-21 and 26-31; and page 4, lines 27-32.

Regarding claims 3, 27, mad 51, Pado also fails to disclose may details of the sensor feed back y(n)
received from plant 12. Accordingly, Pado fails to disclose or suggest that "the control input signal
comprises a sinusoidal wave which linearly increases in frequency over time."

Examiner's response:

¶ 11. applies. MPEP 211.01 Plain Meaning cites guidance from In re American

Academy of Science Tech Center, 367 F.3d 1359, 1369, 70 USPQ2d 1827, 1834 (Fed.

Cir.2004) "Although claims of issued patents are interpreted in light of the specification,

prosecution history, prior art and other claims, this is not the mode of claim

interpretation to be applied during examination. During examination, the claims must be

interpreted as broadly as their terms reasonably allow." Under such guidance, the

generic "signal generator" is interpreted as the training data set for the neural network

Pado et al., c7:1-4. Further, claims 3, 27 and 51 do not limit to "sensor feed back y(n) received from plant 12."

Examination Considerations

8.   The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater,* 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

9.   Examiner's Notes are provided with the cited references to prior art to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but a link to prior art that one of ordinary skill in the art would find inherently appropriate.

10.   Unless otherwise annotated, Examiner's statements are to be interpreted in

reference to that of one of ordinary skill in the art. Statements made in reference to the

condition of the disclosure constitute, on the face of it, the basis and such would be

obvious to one of ordinary skill in the art, establishing thereby an inherent prima facie

statement.

11.   Examiner's Opinion: ¶¶ 8.-10. apply. The Examiner has full latitude to interpret

each claim in the broadest reasonable sense.

Conclusion

12.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

13.   Claims 1-72 are rejected.

Correspondence Information

14.   Any inquiry concerning this information or related to the subject disclosure

should be directed to the Primary Examiner, Joseph P. Hirl, whose telephone number is

(571) 272-3685. The Examiner can be reached on Monday – Thursday from 5:30 a.m.

to 4:00 p.m.

As detailed in MPEP 502.03, communications via Internet e-mail are at the

discretion of the applicant. Without a written authorization by applicant recorded in the

applicant's file, the USPTO will not respond via e-mail to any Internet correspondence

which contains information subject to the confidentiality requirement as set forth in 35

U.S.C. 122. A paper copy of such correspondence will be placed in the appropriate

patent application. The following is an example authorization which may be used by the

applicant:

> Notwithstanding the lack of security with Internet Communications, I hereby authorize the USPTO
> to communicate with me concerning any subject matter related to the instant application by e-
> mail. I understand that a copy of such communications related to formal submissions will be
> made of record in the applications file.

If attempts to reach the Examiner by telephone are unsuccessful, the

Examiner's supervisor, David R. Vincent can be reached at (571) 272-3080.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

Hand delivered to:

Receptionist,

Customer Service Window,
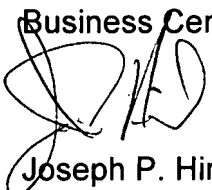
Randolph Building,

401 Dulany Street,

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 273-8300 (for formal communications intended for entry.

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you have any questions on access to Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll free).

Joseph P. Hirl
Primary Examiner
September 5, 2007